IS 7554 (2009): Toe puff and counter stiffener [CHD 19: Footwear]

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भारतीय मानक

टो पफ और कांउटर स्टीफनर — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

TOE PUFF AND COUNTER STIFFENER — SPECIFICATION

(First Revision)

ICS 59.140.35; 61.060

BUREAU OF INDIAN STANDARDS
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Price Group 6

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Footwear Sectional Committee had been approved by the Chemical Division Council.

The standard was first published in 1974. In this revised standard the title has been changed as the need was felt to include requirements of Toe Puffs also. This version has prescribed requirements based on the performance requirements of the counter stiffener and toe puff.

The composition of the Committee responsible for formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TOE PUFF AND COUNTER STIFFENER — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the specifications and methods of test for toe puff and counter stiffener meant for use in shoes.

2 REFERENCES

The standards listed below contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
196 : 1966	Atmospheric condition for testing
1638 : 1969	Specification for sizes and fitting of footwear
2050 : 1991	Glossary of terms relating to footwear
4905 : 1968	Methods for random sampling

3 TYPE AND CLASSIFICATION

3.1 Toe puffs are of the following types:

a) Very hard,
b) Hard,
c) Medium (with or without ping-pong effect), and
d) Soft (with or without ping-pong effect).

3.2 Counter stiffeners are of the following types:

a) Very hard,
b) Hard,
c) Medium(with or without ping-pong effect), and
d) Soft (with or without ping-pong effect).

3.3 Classification

3.3.1 Toe puffs and counter stiffeners are classified, based on the end use as follows:

a) Industrial and high quality footwear,
b) Comfort, town and fashion shoes, and
c) Inexpensive and light use footwear.

4 MATERIALS

4.1 Heat Activated Thermoplastic Impregnated Fabric or Non-woven Materials

4.2 Solvent Activated Materials

4.3 Non-thermoplastic Fibre Board/Leather Board Materials for Counter Stiffeners

4.4 Heat Activated Extruded Thermoplastic Filmic Materials with or without backer

5 REQUIREMENTS

5.1 Toe puff and counter stiffener shall satisfy the requirements as given in Table 1 and Table 2, respectively.

Table 1 Requirement for Puff

Sl No.	Characteristic	Requirement				Method of Test, Ref to
		Very Hard	Hard	Medium	Soft	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	First dry collapsing load, hardness, N, *Min*	> 130	130-81	80-31	< 30	A-3.2.6
ii)	Resilience, percent, *Min*:					
	a) All types other than filmic material	25	30	40	50	A-3.4
	b) For filmic materials, *Min*	30	40	50	70	
iii)	Moisture resistance, percent, *Min*	Class A 80	Class B 65		Class C 50	A-3.5
iv)	a) Initial dry area shape retention, percent	60-80	60-80		60-80	A-3.1
	b) Area shape retention after 10th collapse, dry, percent, *Min*	50	50		50	A-3.3
v)	Peel strength, N/cm, *Min*	5	5		5	Annex B

Table 2 Requirements for Counter Stiffener

(*Clause* 5.1)

Sl No.	Characteristic	Requirement				Method of Test, Ref to
		Very Hard	Hard	Medium	Soft	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	First dry collapsing load, hardness, N, *Min*	> 130	130-81	80-31	< 30	A-3.2.6
ii)	Resilience, percent, *Min*:					
	a) All types other than filmic material	25	30	40	50	A-3.4
	b) For filmic materials, *Min*	30	40	50	70	
iii)	Moisture resistance, percent, *Min*	Class A	Class B		Class C	
		80	60		40	A-3.5
iv)	a) Initial dry area shape retention, percent, *Min*	85	70		55	A-3.1
	b) Area shape retention after 10th collapse, dry, percent, *Min*	75	60		45	A-3.3
v)	Peel strength, N/cm, *Min*	5	5		5	Annex B

5.2 The size and thickness of toe puff and counter stiffener shall be as agreed to between the purchaser and the supplier.

6 PACKING

Toe puff and counter stiffener shall be packed as agreed to between the purchaser and the supplier. Each package shall contain same type, class, size and quantity .

7 MARKING

7.1 Each pack shall be marked with the following:

a) Type and class of the toe puff/counter stiffener,

b) Date of manufacture/batch code, and

c) Size and thickness of the toe puff/counter stiffener.

7.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and Rules and Regulations made thereunder. The details of conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING

Representative samples for testing the performance of toe puff/ counter stiffener shall be drawn as prescribed in Annex C.

ANNEX A

(*Tables* 1 *and* 2)

TEST METHODS

A-1 TEST APPARATUS

A-1.1 Dome Forming Tool, Dome forming tool comprises of:

a) a rigid heat and solvent resistant metal consisting of a dome capped piston of diameter 47.5 ± 0.5 mm dome of curvature radius 35.0 ± 0.5 mm. This will produce a dome height of 9.3 ± 0.2 mm;

b) a metal cylinder with an internal diameter less than 48 mm but large enough to allow the piston to move freely within it;

c) a length of at least 25 mm clamping ring flange on one end to take the clamping ring as specified;

d) a means of holding the piston to the cylinder in a position such that the edge of the domed cap is aligned with the outer surface of the clamping ring flange;

e) a clamping ring with an internal diameter of

less than 48 mm but large enough to allow the piston to move freely within it;

f) an external diameter and design of any surface pattern that should ensure that the test specimen does not slip during the test, and should neither stretch nor compress the central area of the test specimen when it is clamped;

g) a method of tightening the clamping ring to the clamping flange on the end of the cylinder; and

h) a schematic diagram of the dome forming tool is given in Fig. 1.

A-1.2 Device, Such as a Press, for forcing the piston into the metal cylinder.

A-1.3 Device for Cutting, a device, such as a press knife for—

a) cutting circular test specimens of diameter 57 ± 1 mm to fit the dome forming tool;

b) cutting polyethylene rings of suitable diameter for the dome forming tool with external diameter 57 ± 1mm and internal diameter 38 ± 1 mm; and

c) cutting circular test specimens of diameter to fit into the mould of the apparatus indicated at **A-1.10** of diameter 63.5 ± 2 mm.

A-1.4 Thin Polyethylene Sheet Material

A-1.5 An Electric Fan

A-1.6 Fan Assisted Oven Capable of Maintaining Temperature of 95 ± 5°C

A-1.7 Heat Resistant Gloves

A-1.8 Acetone or Other Solvent, recommended by the toe puff or counter stiffener manufacturer.

A-1.9 Silicone Based Release Agent, in the form of a spray.

A-1.10 Two Part Metal Mould, with a lower block having a spherical recess of diameter 47.5 ± 0.5 mm, depth 9.3 ± 0.2 mm and radius of curvature 35.0 ± 0.5 mm and an upper block having a downward facing spherical dome of the same dimensions as the spherical recess in the lower block, such that the dome will fit into the recess.

A-1.10.1 A schematic mechanism for holding together the two halves of the mould is shown in Fig. 2.

A-1.11 Hydraulic Press, capable of applying a force of up to 120 ± 10 kN to the mould.

A-1.12 Source of Steam, such as an electric kettle where water can be kept at boiling point.

A-1.13 Tongs or Similar Apparatus, for holding test specimens in a jet of steam.

A-1.14 Height Gauge, consisting of a flat plate with a clamping ring meeting the requirements and fitted on its lower surface.

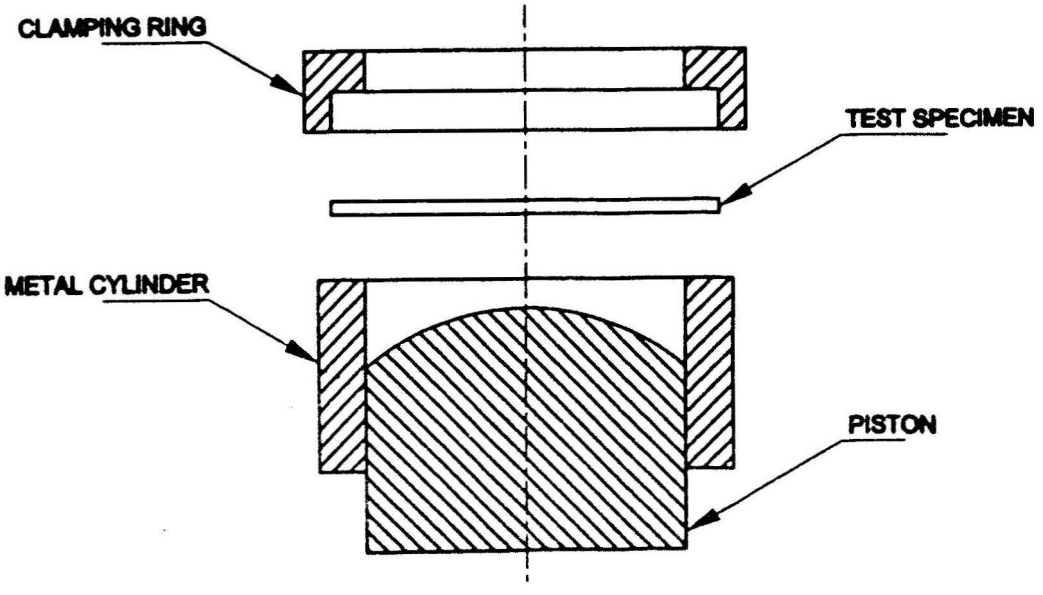

FIG. 1 DOME FORMING TOOL

A-1.14.1 A means of supporting the plate so that;

a) it is horizontal,
b) clamping ring is lowermost, and
c) there is at least 20 mm of clearance below the plate.

A-1.14.2 A hole through the plate which is at the centre of the clamping ring and of diameter less than the clamping ring but large enough to allow the spindle of the thickness gauge (*see* **A-1.15**) to move freely within it.

A-1.15 Thickness Gauge

A thickness gauge which,

a) has a spindle with a spherical lower surface of radius 1.5 ± 0.2 mm;
b) applies a force of 0.55 ± 0.10 N to the spindle;
c) is capable of measuring to the nearest 0.05 mm; and
d) is mounted so that the spindle passes vertically through the hole in the flat plate.

A-1.15.1 A schematic diagram of the height gauge is given in Fig. 3.

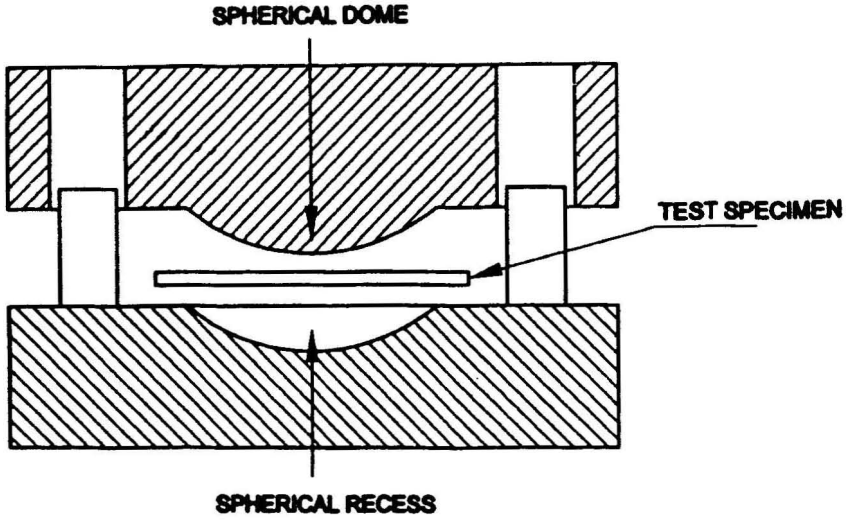

FIG. 2 TWO PART METAL MOULD

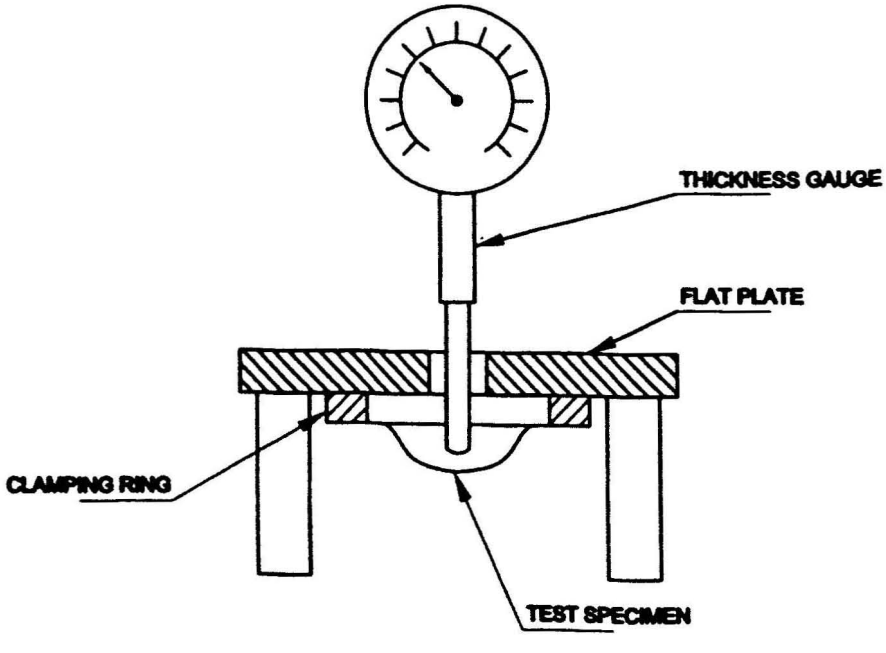

FIG. 3 THICKNESS GAUGE

A-1.16 Tensile Testing Machine

A tensile testing machine with,

a) a jaw separation rate of 50 ± 5 mm/min; and
b) a force range appropriate to the test specimen material. This will usually be less than
   1) 200 N for toe puff materials, and
   2) 500 N for stiffener materials.

A-1.17 Compression Cage

A compression cage for use with the tensile testing machine, with,

a) a vertically mounted plunger, the end face of which is circular and has a diameter of 20.00 ± 0.25 mm;
b) a platform upon which the domed test specimen can be mounted centrally under the plunger; and
c) a minimum clearance of 20 mm between the plunger and the platform.

A-1.17.1 A schematic diagram of the compression cage is provided at Fig. 4.

A-1.18 A device for manually compressing the domed test specimens with,

a) a vertically mounted plunger, the end face of which is circular and has a diameter of 20.00 ± 0.25 mm;
b) a rigid base plate upon which the domed test specimen can be mounted centrally under the plunger; and
c) a minimum clearance of 20 mm between the base plate and the plunger.

A-1.18.1 A schematic diagram of the height gauge is given in Fig. 5.

A-1.19 Distilled or De-ionized Water

A-2 PREPARATION OF TEST SPECIMENS

A-2.1 Method 1 (Applicable for Heat Activated Materials)

A-2.1.1 Use the device [*see* **A-1.3(a)**] to cut six circular test specimens of suitable diameter. In the case of sheet material no part of any test specimen should be cut from an area closer than 50 mm to a manufactured edge.

A-2.1.2 If the test specimen material is coated with adhesive on only one side, use the device [*see* **A-1.3(b)**] to cut six polyethylene rings from the polyethylene sheet material.

A-2.1.3 If the test specimen material is coated with adhesive on both sides, use the device [*see* **A-1.3(c)**] to cut six discs of polyethylene additionally. Follow the procedure in section (*see* **A-2.1.2**) to cut six rings of polyethylene.

A-2.1.4 If the test specimen material is not coated with adhesive, place one of the test specimens centrally over the flange of the metal cylinder.

A-2.1.5 If the test specimen material is coated with adhesive on only one side, place one of the test specimens centrally over the flange of the metal

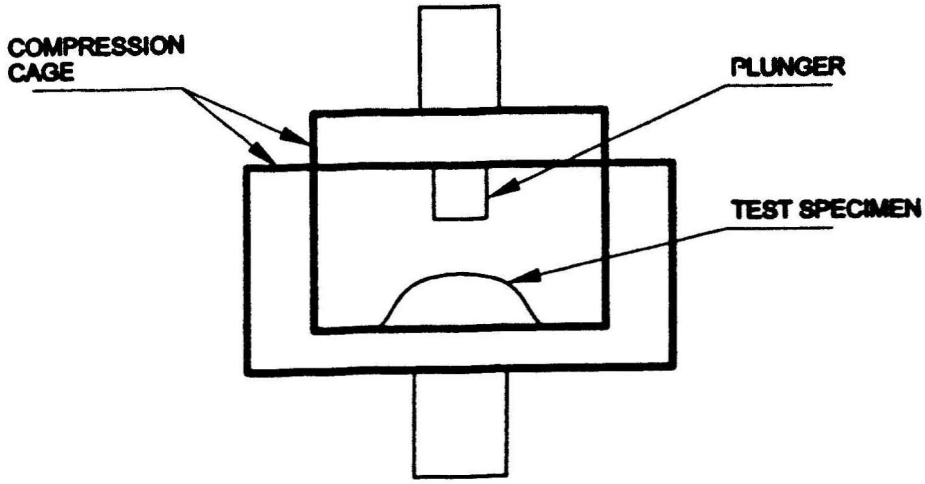

FIG. 4 COMPRESSION CAGE

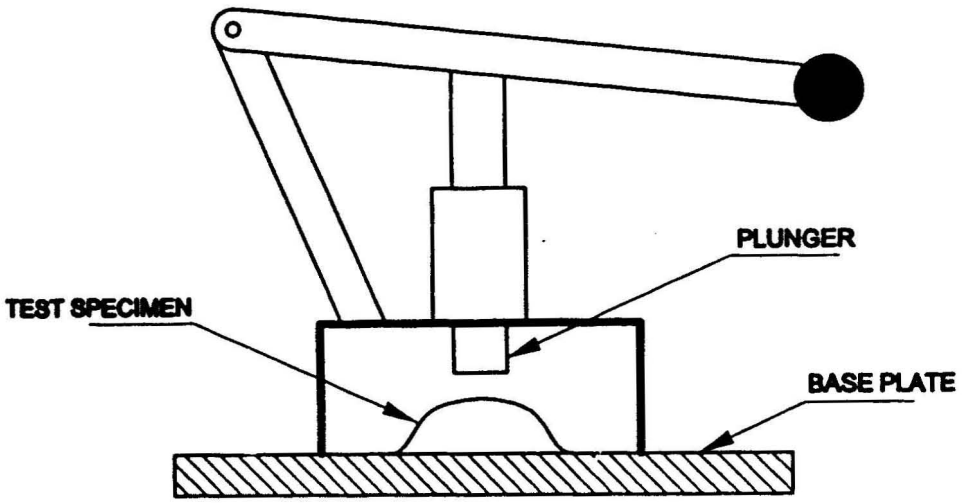

FIG. 5 MANUAL COMPRESSION DEVICE

cylinder with the coated side uppermost. Place a polyethylene ring over the test specimen before fitting the clamping ring.

A-2.1.6 If the test specimen material is coated with adhesive on both sides, place a polyethylene disc centrally over the flange of the metal cylinder, followed by one of the test specimen and a polyethylene ring.

A-2.1.7 Fit the clamping ring centrally over the test specimen and fully tighten it to the flange of the metal cylinder so that the specimen is securely clamped.

A-2.1.8 Activate the test specimen by heating the clamped test specimen assembly in the oven at 95 ± 5°C for 8.5 ± 0.5 min. Remove the test specimen assembly from the oven, wearing heat resistant gloves; then form the test specimen into a dome shape within a minute.

A-2.1.9 Use the device (*see* **A-1.2**) to force the piston into the test specimen until the edge of the piston is aligned with the outer surface of the flange of the cylinder. The test specimen will now be formed into a dome shape. Clamp the piston in this position.

A-2.1.10 Leave the test specimen assembly in a standard controlled environment of 27 ± 2°C and 65 ± 2 percent relative humidity in front of the fan for at least 1.5 h.

A-2.1.11 Slowly withdraw the piston. If it is withdrawn too quickly this may cause the test specimen to be sucked down. Remove the test specimen from the dome forming tool. From this stage onwards take care not to accidentally deform the domed test specimen.

A-2.1.12 Store the test specimen in a standard controlled environment of 27± 2°C and 65 ± 2 percent relative humidity for at least 24 h and carry out the test in this environment.

A-2.1.13 Repeat the procedure to make domed test specimens for the remaining test pieces.

A-2.2 Method 2 (Applicable for Solvent Activated Materials)

A-2.2.1 Use the device [*see* **A-1.3(a)**] to cut six circular test specimens of suitable diameter. In the case of sheet material no part of any test specimen should be cut from an area closer than 50 mm to a manufactured edge.

A-2.2.2 Use the device [*see* **A-1.3(b)**] to cut six rings from the polyethylene sheet material.

A-2.2.3 Use the device [*see* **A-1.3(c)**] to cut six circular discs of polyethylene.

A-2.2.4 Spray the piston and the interior of the dome forming tool with the release agent (*see* **A-1.9**). This is a precautionary measure to prevent any contamination to the dome forming tool that may be caused by the solvent and the polyethylene.

A-2.2.5 Activate the test specimen by applying acetone or other solvent to it until it is uniformly wetted, then leave it for 2.5 ± 0.5 min.

A-2.2.6 Place a polyethylene disc centrally over the flange of the metal cylinder followed by the activated test specimen and a polyethylene ring.

A-2.2.7 Fit the clamping ring centrally over the test specimen and fully tighten it to the flange of the metal cylinder so that the specimen is securely clamped.

A-2.2.8 Use the device (*see* **A-1.2**) to force the piston into the test specimen until the edge of the piston is aligned with the outer surface of the flange of the cylinder. The test specimen will now be formed into a dome shape. Clamp the piston in this position.

A-2.2.9 Leave the test specimen assembly in a standard controlled environment of 27 ± 2°C and 65 ± 2 percent relative humidity in front of the fan for at least 24 h.

A-2.2.10 Slowly withdraw the piston. If it is withdrawn too quickly this may cause the test specimen to be sucked down. Remove the test specimen from the dome forming tool. From this stage onwards take care not to accidentally deform the domed test specimen.

A-2.2.11 Store the test specimen in a standard controlled environment of 27 ± 2°C and 65 ± 2 percent relative humidity for at least 24 h and carry out the test in this environment.

A-2.2.12 Repeat the above procedure to make domed test specimens for the remaining test pieces. Alternatively, if the appropriate apparatus is available, six test specimens may be prepared simultaneously.

A-2.3 Method 3 (Applicable for Non-thermoplastic Fibreboard/Leather Board Materials)

A-2.3.1 If required, store the test material in a standard controlled environment.

A-2.3.2 Use the device (*see* **A-1.3**) to cut six circular test specimens of suitable diameter. In the case of sheet material no part of any test specimen should be cut from an area closer than 50 mm to a manufactured edge.

A-2.3.3 Grip a test specimen with the apparatus (*see* **A-1.13**) and hold it in a jet of steam from the device (*see* **A-1.12**) to maintain it at approximately 50°C for 6 min. Rotate the test specimen in the jet so that it is heated and moistened uniformly.

A-2.3.4 Immediately place the test specimen on the lower block of the mould so that it is positioned centrally over the spherical recess.

A-2.3.5 Fit the upper block of the mould and place the assembly in the hydraulic press (*see* **A-1.11**).

A-2.3.6 Apply force to the assembly as follows:

a) 100 ± 10 kN for a leatherboard sample, and
b) 120 ± 10 kN for a fiberboard sample.

A-2.3.7 Maintain this force for 3.0 ± 0.1 min, then remove the mould from the press and the test specimen from the mould.

A-2.3.8 Store the test specimen in a standard controlled environment of 27 ± 2°C and 65 ± 2 percent relative humidity for at least 24 h and carry out the test in this environment.

A-2.3.9 Repeat the procedure to make domed test specimens for the remaining test pieces. Alternatively, if the appropriate apparatus is available, six test specimens may be prepared simultaneously.

A-3 PROCEDURE

A-3.1 Determination of Initial Dry Area Shape Retention

A-3.1.1 Support the flat plate with the clamping ring lowermost.

A-3.1.2 Fit the device (*see* **A-1.14**) to the flat plate so that the hole in the plate is covered from the lower surface.

A-3.1.3 Gently lower the spindle of the thickness gauge (*see* **A-1.15**) through the hole in the flat plate until it makes contact with the top surface of the plate of the device.

A-3.1.4 When the spindle of the thickness gauge has applied a force to the device for 5 ± 1 s record the reading on the gauge to the nearest 0.05 mm. Record this value as (X).

A-3.1.5 Remove the flat plate from the device.

A-3.1.6 Fit the test specimen to the flat plate using the clamping ring.

A-3.1.7 Support the flat plate so that the domed test specimen is inverted.

A-3.1.8 Gently lower the spindle of the thickness gauge through the hole in the flat plate until it makes contact with the inner surface of the domed test specimen.

A-3.1.9 When the spindle of the thickness gauge has applied a force to the test specimen for 5 ± 1s, record the reading on the gauge to the nearest 0.05 mm. Record this value as (Y).

A-3.1.10 Remove the test specimen from the flat plate.

A-3.1.11 Calculate the height of the test specimen (H_2) using the formula:

$$H_2 = Y - X$$

A-3.1.12 Calculate the area shape retention value of the test specimen (S), in percent to the nearest one percent, using the formula:

$$S = \frac{H_2^2}{H_1^2} \times 100$$

where

H_1 = height of the relevant forming tool.

A-3.1.13 Repeat the procedure for the remaining five test specimens.

A-3.1.14 Calculate the arithmetic mean of the shape retention values to the nearest one percent. Record this value as the initial dry area shape retention.

A-3.1.15 Set aside three test specimens for testing wet. The remaining three will be tested for dry collapsing load.

A-3.2 Determination of Tenth Dry Collapsing Load-Hardness

A-3.2.1 Fit the compression cage (*see* **B-1.17**) to the tensile testing machine (*see* **A-1.16**).

A-3.2.2 Place the test specimen centrally under the plunger and operate the machine with a crosshead speed of 50 ± 5 mm/min.

A-3.2.3 Stop the tensile testing machine once the peak force has been reached and record this value as (L) to the nearest Newton.

A-3.2.4 Return the jaws of the tensile testing machine to their starting position and remove the test specimen.

A-3.2.5 Repeat the procedure for the two remaining test specimens.

A-3.2.6 Calculate the arithmetic mean of the three peak load values (L) to the nearest Newton and record this value as the first dry collapsing load.

A-3.2.7 Manually push out any deformation from one of the test specimens and place it centrally under the plunger of the manual compression device (*see* **A-1.18**).

A-3.2.8 Use this device to collapse the test specimen ensuring that the dome of the test specimen touches the base plate.

A-3.2.9 Repeat the procedure for a further seven times.

A-3.2.10 Repeat the procedure for the two remaining specimens.

A-3.2.11 Determine the peak load value (L) of the test specimens.

A-3.2.12 Calculate the arithmetic mean of the peak load values (L) to the nearest Newton and record this value as the tenth dry collapsing load.

A-3.3 Determination of Area Shape Retention After 10th Collapse, Dry

A-3.3.1 Manually push out any deformation from the test specimens, then follow the procedure in sections **A-3.1.6** to **A-3.1.12** nine more times.

A-3.3.2 Calculate the arithmetic mean of the three shape retention values to the nearest one percent. Record this value as the area shape retention after 10th collapse, dry.

A-3.3.3 *Wet Collapsing Load Test*

A-3.3.4 Soak the remaining three test specimens in distilled or deionised water at 27 ± 2°C for approximately 1h.

A-3.3.5 Determine the area shape retention values and collapsing loads for the three wet test specimens by following the procedure in **A-3.1** to **A-3.3**.

A-3.4 Resilience

A-3.4.1 Calculate the resilience of the test specimen material, in percent to the nearest 1 percent, using the formulae:

$$\text{Resilience} = \frac{\text{10th dry collapsing load} \times 100}{\text{First dry collapsing load}}$$

A-3.5 Moisture Resistance

A-3.5.1 Calculate the moisture resistance of the test specimen, in percent to the nearest 1 percent, using the formula:

$$\text{Moisture resistance} = \frac{\text{First wet collapsing load}}{\text{First dry collapsing load}} \times 100$$

ANNEX B

(*Tables* 1 *and* 2)

DETERMINATION OF PEEL STRENGTH

B-1 TEST PIECES

Cut six test specimens. The test pieces used for shape stability and repeated load test can also be used for this test. The length of the test piece shall be greater than 50 mm and the width shall be 10 mm.

B-2 APPARATUS AND MATERIALS

B-2.1 Universal Tensile Testing Machine, with rate of traverse of 100 mm/min.

B-2.2 Laboratory Press, comprising of two platens, heating upto 150°C and pressure of 6 bar.

B-2.3 Solvent, like acetone, methyl ethyl ketone or any other solvent recommended by the toe puff or counter stiffener manufacturer.

B-3 FOR SOLVENT ACTIVATED MATERIALS

B-3.1 Preparation of sample.

B-3.1.1 Bond the upper leather to the interlining using synthetic latex.

B-3.1.2 Dip the toe puff/counter stiffener into the solvent for 30 s. Dry for 1 to 2 min.

B-3.1.3 Lay the toe puff/counter stiffener between the interlining and the leather lining.

B-3.1.4 Place the assembly under the press for 40 s at 5 bar pressure. Allow to dry for 24 h.

B-3.2 Procedure

B-3.2.1 The bond of the toe puff/counter stiffener onto the interlining is determined. If required, the bond of the toe puff/counter stiffener onto the leather lining can also be determined. Peel strength is expressed in N/cm.

B-3.2.2 Clamp the two open ends of the peel strength assembly in the jaws of the tensile testing machine. Open the bond at a speed of 100 mm/min for 75 mm length.

B-3.2.3 Record the peel strength and divide by the width of the specimen. Determine the average of the six test pieces.

B-4 FOR THERMOPLASTIC TOE PUFF AND COUNTER STIFFENER

B-4.1 Preparation of Sample

B-4.1.1 Bond the upper leather to the interlining using synthetic latex.

B-4.1.2 Lay the toe puff/counter stiffener between the interlining and the leather lining.

B-4.1.3 Heat the assembly upto 110°C for 2 min and then press for 40 s at 5 bar pressure Allow to dry for 24 h.

B-4.2 Procedure

B-4.2.1 The bond of the toe puff/counter stiffener onto the interlining is determined. If required, the bond of the toe puff/counter stiffener onto the leather lining can also be determined. Peel strength is expressed in N/cm.

B-4.2.2 Clamp the two open ends of the peel strength assembly in the jaws of the tensile testing machine. Open the bond at a speed of 100 mm/min for 75 mm length.

B-4.2.3 Record the peel strength and divide by the width of the specimen. Determine the average of the six test pieces.

B-5 FOR NON-THERMOPLASTIC MATERIAL

B-5.1 Preparation of Sample

B-5.1.1 Bond the upper leather to the interlining using synthetic latex.

B-5.1.2 Apply neoprene adhesive to the non-thermoplastic toe puff and counter on both sides and apply neoprene adhesive on the interlining and leather lining.

B-5.1.3 Lay the toe puff counter stiffener between the interlining and the leather lining.

B-5.1.4 Press the assembly for 40 s at 5 bar pressure allow to dry for 24 h.

B-5.2 Procedure

B-5.2.1 The bond of the toe puff/counter stiffener onto the interlining is determined. If required, the bond of the toe puff/counter stiffener onto the leather lining can also be determined. Peel strength is expressed in N/cm.

B-5.2.2 Clamp the two open ends of the peel strength assembly in the jaws of the tensile testing machine. Open the bond at a speed of 100 mm/min for 75 mm length.

B-5.2.3 Record the peel strength and divide by the width of the specimen. Determine the average of the six test pieces.

ANNEX C

(*Clause* 8)

SAMPLING OF TOE PUFFS/COUNTER STIFFENERS

C-1 SCALE OF SAMPLING

C-1.1 Lot

All toe puffs/counter stiffeners of the same type, same shape and with similar dimensions in a consignment shall constitute a lot.

C-1.2 The conformity of toe puffs/counter stiffeners to the requirements of the specification shall be ascertained for each lot separately. The number of toe puffs/counter stiffeners to be selected from the lot shall depend on the lot size and shall be in accordance with Table 3.

C-1.3 These toe puffs/counter stiffeners shall be selected at random from the lot. In order to ensure the randomness of selection, sampling procedures given in IS 4905 may be followed.

C-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

C-2.1 All the toe puffs/counter stiffeners selected under **C-1.2** shall be examined for characteristics as indicated in Table 1 and Table 2. A toe puff/counter stiffener shall be termed as defective if it fails to satisfy any one of the requirements. The lot shall be accepted as conforming to these requirements if the number of defective toe puffs/counter stiffeners found in the sample does not exceed the permissible number of defective toe puffs/counter stiffeners given in col 4 of Table 3.

C-2.2 The lot shall be deemed to conform to the requirements of this standard, if the requirement for **C-2.1** is satisfied.

Table 3 Scale of Sampling and Permissible Number of Defective Toe Puffs/Counter Stiffeners

(*Clause* C-1.2)

Sl No.	Lot Size	No. of Toe Puffs/Counter Stiffeners to be Sampled	Permissible No. of Defective Toe Puffs/Counter Stiffeners
(1)	(2)	(3)	(4)
i)	Up to 1 000	3	1
ii)	1 001 to 3 000	5	2
iii)	3 001 to 5 000	8	2
iv)	5 001 to 8 000	13	3
v)	8 001 to 10 000	20	3

ANNEX D
(Foreword)

COMMITTEE COMPOSITION

Footwear Sectional Committee, CHD 19

Organization	*Representative(s)*
Footwear Design & Development Institute, Noida	SHRI V. B. PARVATIKAR (***Chairman***) MS RASHMI (*Alternate*)
Arvind Footwear Pvt Ltd, Ahmednagar	SHRIMATI PRABHA NATU SHRI S. C. KULKARNI (*Alternate*)
Bata India Limited, Kolkata	SHRI BIPUL DASGUPTA SHRI SUPRIYA KANJI (*Alternate*)
Bengal Waterproof Limited, Kolkata	SHRI PRANESH CHATTERJI SHRI SIDDHARTHA CHOWDHURY (*Alternate*)
Bihar Rubber Co Ltd, Ranchi	SHRI J. BASAK SHRI JAYANTA LAHIRI (*Alternate*)
Border Security Force, New Delhi	SHRI B. N. SHARMA SHRI MAYANK UPADHAY (*Alternate*)
Central Footwear Training Institute, Agra	SHRI S. N. GANGULY SHRI S. CHAKRABORTY (*Alternate*)
Central Footwear Training Institute, Chennai	SHRI PREM PAI
Central Leather Research Institute, Chennai	DR B. N. DAS DR R. RAJARAMAN (*Alternate*)
Coal India Ltd, Kolkata	SHRI B. MISHRA SHRI P. K. HALDER (*Alternate*)
Department of Industrial Policy & Promotion, New Delhi	SHRI P. K. JAIN SHRI N. C. TIWARI (*Alternate*)
Directorate General of Mines Safety, Dhanbad	DIRECTOR DEPUTY DIRECTOR (*Alternate*)
Dye General Aeronautical Quality Assurance (DGAQA), New Delhi	SHRI INDER PAL WG-CDR S.K. MOITRA (*Alternate*)
Indian Footwear Components Manufacturer's Association (IFCOMA), Kolkata	SHRI MANI ALMAL (APL POLYFAB)
Indian Leather Technologist's Association, Kolkata	SHRI S. K. BHADRA SHRI A. K. BASU (*Alternate*)
Lal Bahadur Shastri Institute of Management, New Delhi	PROF MANMOHAN BAKAYA
Liberty Shoes Ltd (P.U. Division), Karnal	SHRI ADESH GUPTA SHRI S. S. LAHIRI (*Alternate*)
M/s Khadim Chain Stores Ltd (Manufacturing Division), Kolkata	SHRI B. M. CHAUDHURI
M/s Top Lasts, Agra	SHRI U. S. PAUL
Ministry of Defence (DGQA Complex), Kolkata	SHRI GAUTAM GUPTA
Steel Authority of India Ltd, Bhilai	SHRI V. K. AGARWAL SHRI A. K. SAHA (*Alternate*)
The Indian Rubber Institute, Kolkata	SHRI B. DUTTA SHRI AMITAVA PAL (*Alternate*)
In personal capacity (*B 12/3, Karunamoyee Estate, Phase I Salt Lake, Kolkata*)	SHRI BIRESWAR BANERJEE
BIS Directorate General	SHRI E. DEVENDAR, Scientist F & H (CHD) [Representing Director General (*Ex-officio*)]

Member Secretary
SHRIMATI MEENAL PASSI
Scientist D (CHD), BIS

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